

## **Section 7096**

(October 2002)

7096	Capabilities
7096.1	ICS Designation for Engine
7096.1.1	Engine Equipment Complement
7096.1.2	CDF Engine Models and Complements
7096.2	ICS Designation for Bulldozers
7096.2.1	ICS Bulldozer Capabilities
7096.2.2	Dozer Operation Rates of Construction
7096.3	Fire Crew Production Rates
7096.4	CCV Drivers Conversion Table
7096.5	ICS Designation For Aircraft

**CAPABILITIES**  
(October 2002)

**7096**

**I.C.S. DESIGNATION FOR ENGINES**  
(October 2002)

**7096.1**

In the utilization of the Incident Command System, engines are assigned to an incident in one of three ways: a single resource, a strike team, or a task force.

- A single resource engine is assigned as an independent unit and generally reports directly to a Division or Group Supervisor.
- A strike team of engines is five engines of the same type with common communications and assigned to a Strike Team Leader.
- Engines working in a task force configuration are engines of different types or engines assigned to work with other kinds of resources to achieve a specific objective. These resources are required to have common communications and work under the direction of a Task Force Leader.

The Incident Command System classifies engines by their capabilities. Engines as single resources are identified as Type 1 through Type 4. When engines are in a Strike Team configuration, their type is identified through the use of the letters A through D. For example, a strike team of Type 3 CDF engines is given a four number identifier followed by the letter "C"; ST 9340C.

The following chart identifies the type of engine and the appropriate minimum capabilities.

TYPE	1(A)	2(B)	3(C)	4(D)
PUMP CAP. GPM	1000	500	120	50
WATER CAP. GPM	400	400	300	200
2 1/2 HOSE FT.	1200	1000	N/A	N/A
1 1/2 HOSE FT.	400	500	1000	300
1" HOSE FT	200	300	800	800
LADDER FT	20	20	N/A	N/A
HEAVY STREAM GPM	500	N/A	N/A	N/A
STAFFING MIN.	4	3	3	3
TOTAL IN ST	21	16	16	16

**ENGINE EQUIPMENT COMPLEMENT** 7096.1.1  
(October 2002)

**CDF ENGINE MODELS AND COMPLEMENTS** 7096.1.2  
(October 2002)

**MODEL # 1**

TYPE	3
SEATING	6 persons
DRIVE TYPE	Conventional
TANK CAPACITY	500 gallons
MAIN PUMP RATING	300 GPM @ 150 psi (midship)
AUXILLARY PUMP RATING	85 GPM @ 150 psi
1 ½" HOSE	1300 feet
1' HOSE	800 feet
BOOSTER HOSE	300 feet (2 reels)
Average Vehicle Operating Weight	20,720 lbs

**MODEL #5**

TYPE	3
SEATING	6 persons
DRIVE TYPE	4-wheel drive
TANK CAPACITY	500 gallons
MAIN PUMP RATING	300 GPM @ 150 psi (midship)
AUXILLARY PUMP RATING	85GPM @ 150 psi
1 ½' HOSE	1300 feet
1"HOSE	800 feet
BOOSTER HOSE	300 feet (2 reels)
Average Vehicle Operating Weight	24,180 lbs

**MODEL # 9**

TYPE	3
SEATING	6 person
DRIVE TYPE	Conventional
TANK CAPACITY	650 gallons
MAIN PUMP RATING	500 GPM @ 150 psi (skid mount)
2 ½" HOSE	500 feet
1 ½" HOSE	1300 feet
1' HOSE	800 feet
BOOSTER HOSE	300 feet (2 reels)
Average Vehicle Operating Weight	26,480 lbs

### **MODEL #11**

TYPE	3
SEATING	3 person
DRIVE TYPE	Conventional
TANK CAPACITY	1250 gallons
MAIN PUMP RATING	500 GPM @ 150 psi (skid mount)
2 ½" HOSE	500 feet
1 ½' HOSE	1600 feet
1"HOSE	800 feet
BOOSTER HOSE	300 feet (2 reels)
Average Vehicle Operating Weight	31,700 lbs

### **MODEL # 12**

TYPE	3
SEATING	5 person
DRIVE TYPE	Conventional
TANK CAPACITY	500 gallons
MAIN PUMP RATING	300 GPM @ 150 psi (skid mount)
1 ½" HOSE	1300 feet
1' HOSE	800 feet
BOOSTER HOSE	300 feet (2 reels)
Average Vehicle Operating Weight	35,000 lbs

### **MODEL # 14**

TYPE	3
SEATING	5 person
DRIVE TYPE	4 –wheel drive
TANK CAPACITY	500 gallons
MAIN PUMP RATING	500 GPM @ 150 psi (hydrostatic)
2 ½" HOSE	500 feet
1 ½" HOSE	1600 feet (including pre-connects)
1' HOSE	800 feet
BOOSTER HOSE	300 feet (2 reels)
Average Vehicle Operating Weight	26,900 lbs

### **MODEL #15**

TYPE	3
SEATING	5 person
DRIVE TYPE	Conventional
TANK CAPACITY	500 gallons
MAIN PUMP RATING	500 GPM @ 150 psi (hydrostatic)
2 ½" HOSE	500 feet
1 ½' HOSE	1600 feet (including pre-connects)
1"HOSE	800 feet
BOOSTER HOSE	300 feet (2 reels)
Average Vehicle Operating Weight	25,380 lbs

### **MODEL # 16**

TYPE	1*
SEATING	6 person
DRIVE TYPE	Conventional
TANK CAPACITY	750 gallons
MAIN PUMP RATING	1000 GPM @ 150 psi
2 ½" HOSE	1500 feet
1 ½" HOSE	1300 feet
1 ¾" HOSE	600 feet
1' HOSE	800 feet
Average Vehicle Operating Weight	31,000 lbs

### **MODEL #17**

TYPE	2*
SEATING	6 person
DRIVE TYPE	Conventional
TANK CAPACITY	700 gallons
MAIN PUMP RATING	500 GPM @ 150 psi
2 ½" HOSE	1500 feet
1 ½' HOSE	1300 feet
1 ¾" HOSE	600 feet
1"HOSE	800 feet
Average Vehicle Operating Weight	N/A

## MODEL # 18

TYPE	2*
SEATING	4 person
DRIVE TYPE	Conventional
TANK CAPACITY	600 gallons
MAIN PUMP RATING	1000 GPM @ 150 psi
AUXILLARY PUMP RATING	150 GPM @ 133 psi
2 ½' HOSE or LARGER	500 feet
1 ½" HOSE	1300 feet
1 ¾" HOSE	300 feet
1' HOSE	800 feet
BOOSTER HOSE	150 feet
Average Vehicle Operating Weight	N/A

## MODEL #25

TYPE	3*
SEATING	4person
DRIVE TYPE	Conventional
TANK CAPACITY	500 gallons
MAIN PUMP RATING	1000 GPM @ 150 psi
AUXILLARY PUMP RATING	175 GPM @ 150 psi
2 ½' HOSE or LARGER	800 feet
1 ½" HOSE	1800 feet
1 ¾" HOSE	300 feet
1' HOSE	800 feet
BOOSTER HOSE	150 feet
Average Vehicle Operating Weight	28,000 lbs

\*Within the **CDF** system these engines are utilized as TYPE III engines and meet all the appropriate ICS requirements.

## I.C.S. DESIGNATION FOR BULLDOZERS

**7096.2**

(October 2002)

In the utilization of the Incident Command System, bulldozers are assigned to an incident in one of three ways; a single resource, a strike team or a task force.

- A single resource dozer is assigned as an independent unit and generally reports directly to a Division or Group Supervisor.
- A strike team of dozers is two dozers of the same type and a dozer tender assigned to a Strike Team Leader, all with common communications.
- Dozers working in a task force configuration are dozers of different types or numbers or dozers assigned to work with other kinds of resources to achieve a specific objective. These resources are required to have common communications and work under the direction of a Task Force Leader.

The Incident Command System classifies dozers by their size. Dozers as a single resource are identified as Type 1 through Type 3. When dozers are used in a Strike Team configuration, their type is identified through the use of the letters **K**, **L**, and **M**. For example, a strike of Type 2 CDF dozers is given a four number identifier followed by the letter "L", ST 9428L.

## **ICS BULLDOZER CAPABILITIES**

**7096.2.1**

(October 2002)

<b>COMPONENTS</b>	<b>TYPE 1(K)</b>	<b>TYPE 2(L)</b>	<b>TYPE 3(M)</b>
Size	Heavy	Medium	Light
Horse Power	200 HP	100 HP	50 HP
# of Operators	2 per 24 hrs	2 per 24 hrs	2 per 24 hrs
Examples	D-7, D-8	D-5, D-6	D-4

## **DOZER OPERATION RATES OF CONSTRUCTION**

**7096.2.2**

(October 2002)

### **RATE OF CONSTRUCTION – YARDS PER HOUR**

The following chart is a more complete measure of production rates.

#### **LIGHT VEGETATION**

Percent Slope	<b>Medium Dozers</b>		<b>Heavy Dozers</b>		Percent Slope
	Downgrade	Upgrade	Downgrade	Upgrade	
0	1485	1485	1750	1750	0
10	1600	1400	1900	1470	10
20	1785	975	1930	1130	20
30	2012	675	1830	850	30
40	2060	350	1500	700	40
50	1900	250	1015	635	50

#### **MEDIUM VEGETATION**

0	1485	1485	1750	1750	0
10	1600	1400	1900	1470	10
20	1785	975	1930	1130	20
30	2012	675	1830	850	30
40	2060	350	1500	700	40
50	1900	250	1015	635	50

## HEAVY VEGETATION

Percent Slope	Medium Dozers		Heavy Dozers		Percent Slope
	Downgrade	Upgrade	Downgrade	Upgrade	
0	1485	1485	1750	1750	0
10	1600	1400	1900	1470	10
20	1785	975	1930	1130	20
30	2012	675	1830	850	30
40	2060	350	1500	700	40
50	1900	250	1015	635	50

Average – 885 yards per hour

Average – 935 yards per hour.

Go with the averages – don't dwell on charts.

Rates are averages from the 1967 CDF dozer tests.

\*One pass only – no average.

## FIRE CREW PRODUCTION RATES

**7096.3**

(October 2002)

Rules of thumb for fire crew production rates vary from one source to another. The following is offered as a general guideline, but may be effected by fuel type, density, slope, weather conditions, and other variables.

- One person can cut an average of 20 square yards per hour. This is for the first 2-3 hours.
- A 15 person crew can cut : 15 X 20 sq. yards or 300 sq. yards.
- This indicates that one 15 person can cut: 9 X 300 sq. yards or 2700 sq. feet per hour.
- On average a person will construct line at the following rates per hour (in square yards):

1 <sup>st</sup> hour	-	21.4
2 <sup>nd</sup> hour	-	20.3
3 <sup>rd</sup> hour	-	19.1
4 <sup>th</sup> hour	-	17.9
5 <sup>th</sup> hour	-	16.7

## Another CREW ESTIMATION guide provides the following:

A 15-person fire crew will produce the following per hour:

- Grass ( 2 ft. height ): 900 ft. per hour, 3 ft. wide
- Medium Brush ( 4.5 ft. height): 450 ft. per hour, 6 ft. wide
- Heavy Brush ( 6 ft. height): 300 ft. per hour, 9 ft. wide
- Heaviest Brush ( 9 ft. height): 225 ft. per hour, 12 ft. wide



## CCV DRIVER'S CONVERSION TABLE (October 2002)

7096.4

### EXAMPLE EIGHT-CONSECUTIVE-DAY HOURLY CALCULATION

ARBITRARY DAY DESIGNATION (for illustration only)																				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
TOTAL DRIVING AND ON-DUTY HOURS WORKED EACH DAY (FROM DRIVER'S DAILY LOG)																				
10	10	10	10					10	24	16	16	15	17	12			10	10		
EIGHT-CONSECUTIVE-DAY PERIOD TOTALS																				
							50													
								64												
									70											
										76										
											81									
												98								
													110							
														110						
															100					
																86				
																	80			
																		64		
																			49	
																				32

#### Eight-Consecutive-Day Period

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Days 1 through 4 - Captain works regular shift

Days 5 through 7 - Captain takes normal days off

Day 9 - Captain responds to emergency incident from project and works through night, recording 24 hours of driving and on-duty time (emergency and related operations are exempt from hourly regulation)

Day 14 - Captain is released from emergency incident, returns to camp, completes duties, and computes on-duty hours, indicating a timed-out driving status

Days 14 (following completion of emergency and related operations) through 16 - Captain's driving status is "timed-out"

Day 17 - Captain starts day with current eight-day total of 76 hours allowing 4 hours of driving and on-duty status available (covers crew, but requires relief driver for return to camp, if crew goes to project)

Day 18 - Captain has current eight-day total of 70 hours, allowing 10 hours of driving status available

Days 19 through 21 - Captain resumes normal days off

NOTE: An easy method of determining driving status available for the current day is to add all driving and on-duty hours for the previous seven calendar days and subtract from 80 hours.

## ICS DESIGNATION FOR AIRCRAFT (October 2002)

7096.5

Resource	Radio Call	ICS Type	1	2	3	4
Air Tanker	"Tanker"	Minimum Retardant Gallons	3000+	1800	600	100

(see next section)

(see HB Table of Contents)

(see Forms or Forms Samples)